

4237-F

MULTIMETER, DIGITAL

1. GENERAL. This procurement requires a digital, handheld, ruggedized multimeter with high-voltage and RF probes.

2. CLASSIFICATION. Class 2 in accordance with MIL-PRF-28800 with the following exceptions and additions:

- a. The handle requirement is not invoked.
- b. The conducted EMC tests are not invoked.
- c. The equipment shall be provided with a yellow case for increased visibility.
- d. The 30 cm transit drop test is invoked.
- e. The dripproof test is invoked.

3. MEASUREMENT CAPABILITIES. The equipment shall have at least a 3-1/2 digit display supplemented with a bargraph display. The equipment shall be capable of measuring resistance, voltage, and current within the minimum ranges and accuracies specified below.

3.1 AC voltage characteristics.

3.1.1 Range. 1 mV to 1000V .

3.1.2 Resolution: 1 mV on lowest range.

3.1.3 Accuracy. Up to 10 kHz: 3% iv + 3 digits ; 10 to 30 kHz: 4% + 10 digits within the limitations imposed by the Volts x Hertz product.

3.1.4 Frequency range. 45 Hz to 30 kHz.

3.1.5 AC input impedance. 10 megohms, 100pF.

3.1.6 Maximum input. 1000 Vrms.

3.2 DC voltage characteristics.

3.2.1 DC voltage range. 1 mV to 1000V.

3.2.2 DC voltage accuracy. 0.3% iv + 1 digit.

3.2.3 DC input impedance. 10 megohms.

3.2.4 Displayed DC resolution. 1 mV.

3.2.5 Maximum input. 1000 V.

3.3 Resistance characteristics.

3.3.1 Resistance range. 1 ohm to 32 megohms.

3.3.2 Resistance accuracy. 1% iv + 1 digit.

3.3.3 Resistance resolution. 1 ohm.

3.3.4 Input protection. 500 Vrms.

3.4 AC current characteristics.

3.4.1 AC current range. 1uA to 10A.

3.4.2 AC current accuracy. 1.7% iv + 5 digits.

3.4.3 AC current resolution. 1 uA.

3.4.4 Maximum input. 20A, 600V with fused input.

3.5 DC current characteristics.

3.5.1 DC current range. 1uA to 10A.

3.5.2 DC current accuracy. 1% iv + 5 digits.

3.5.3 DC current resolution. 1 uA.

3.5.4 Maximum input. 20A, 600V with fused input.

3.6 Temperature coefficient. All functions: $\pm(0.1 \times \text{the specified accuracy} / ^\circ\text{C})$.

3.7 Display characteristics. 3200 count minimum with an analog bar-graph. The following indicators are required: input overload, battery state, and polarity.

3.8 Inputs connectors. The equipment shall have at least two female banana-jack input terminals. The low terminal shall be capable of withstanding voltage potentials of 500 Vdc above or below ground potential.

3.9 High voltage probe characteristics. The equipment shall be provided with at least two high voltage probes to meet the following requirements.

3.9.1 5 kV probe characteristics.

3.9.1.1 High voltage range. 1000 to 5000 Vdc and peak ac minimum.

3.9.1.2 Frequency range. DC to 1 kHz minimum.

3.9.1.3 High voltage accuracy. $\pm 2\%$ of input + 1 digit.

3.9.1.4 Input impedance. 75 megohms nominal or greater.

3.9.1.5 Voltage ratio. 1000:1.

3.9.1.6 Probe length. 254 mm (10 in.) maximum.

3.9.2. 40 kV probe characteristics.

3.9.2.1 High voltage range. 1 to 40 kVdc and peak ac minimum.

3.9.2.2 Frequency range. DC to 60 Hz.

3.9.2.3 Accuracy. 5%.

3.9.2.4 Input impedance. 1 gigohm.

3.9.2.5 Voltage ratio. 1000:1.

3.10 RF probe characteristics. An RF probe shall be provided to extend the frequency range for ac voltage measurements.

3.10.1 RF range. 100 khz to 500 Mhz.

3.10.2 Frequency response (relative to 1 Mhz). 100 khz to 200 Mhz: ± 1 dB. 200 Mhz to 500 Mhz: ± 3 dB.

3.10.3 Voltage range. 0.25 to 30 Vrms.

3.10.4 Ac to dc conversion accuracy. ± 1 dB at 1 Mhz for any voltage level within the range of the probe.

3.10.5 Maximum input voltage. 30 Vrms or 200 Vdc.

3.10.6 Input capacitance. 5 pF or less.

3.11 Test leads. The equipment shall be provided with safety-designed test leads that incorporate safety guards or barriers located on the probe body to prevent the operator's hand from inadvertently contacting the probe tip. The maximum exposed metal portion of the tip shall not exceed 19 mm (0.75 in).

3.12 Transit case. A hard transit case is required in accordance with MIL-PRF-28800.

4. GENERAL REQUIREMENTS.

4.1 Power source. MIL-PRF-28800 dc internal power source requirements are invoked. The batteries shall be of a commercially available type and provide 1000 hours of continuous operation before replacement. The nominal power source requirements are not invoked.

4.2 Weight. 0.9 kg (2 lb) maximum for the multimeter. The kit, including probes, accessories and the transit case, shall not exceed 3kg (6.6 lb).

4.3 Dimensions. The multimeter shall be 56 mm (2.2 in) high, 95 mm (3.75 in) wide, and 203 mm (8 in) deep, nominal.

4.4 Battery restrictions. Per MIL-PRF-28800, lithium and mercury batteries are prohibited without prior authorization. A request for approval for the use of lithium and mercury batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

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